

We claim:

1. A crystalline donepezil hydrochloride form H1, characterized by an x-ray powder diffraction spectrum having peaks expressed as 2θ at about 15.2, 18.7, 20.6, 22.3, 23.5, 24.0, 24.6, 27.0, 29.0 and 30.5 degrees.
2. A crystalline donepezil hydrochloride form H1, further characterized by an x-ray powder diffraction spectrum as in figure 1.
3. A process for preparation of donepezil hydrochloride form H1 as defined in claim 1, which comprises the steps of:
 - a) dissolving donepezil free base in methylene dichloride;
 - b) adding hydrochloric acid; and
 - c) precipitating donepezil hydrochloride form H1 from the solution formed in (b) by adding an anti-solvent.
4. A process according to claim 3, wherein the anti-solvent is diisopropyl ether, n-hexane, n-heptane or diethyl ether.
5. A process according to claim 3, wherein the anti-solvent is diisopropyl ether.
6. An another process for preparation of donepezil hydrochloride form H1 as defined in claim 1, which comprises the steps of:
 - a) dissolving donepezil hydrochloride in methylene dichloride; and
 - b) precipitating donepezil hydrochloride form H1 from the solution formed in (a) by adding an anti-solvent.
7. A process according to claim 6, wherein the anti-solvent is diisopropyl ether, n-hexane, n-heptane or diethyl ether.
8. A process according to claim 6, wherein the anti-solvent is diisopropyl ether.
9. A crystalline donepezil hydrochloride form H2, characterized by an x-ray powder diffraction spectrum having peaks expressed as 2θ at about 6.6, 6.8, 10.1, 12.8, 13.7, 15.0, 15.6, 16.5, 17.3, 18.4, 19.5, 19.8, 20.0, 21.6, 21.9, 22.3, 23.9, 24.2, 24.7, 25.3, 26.0, 26.9 and 28.2 degrees.
10. A crystalline donepezil hydrochloride form H2 as defined in claim 9, further characterized by an x-ray powder diffraction spectrum as in figure 2.
11. A process for preparation of donepezil hydrochloride form H2 as defined in claim 9, which comprises the steps of:
 - a) dissolving donepezil free base in toluene;
 - b) adding hydrochloric acid; and

- c) isolating donepezil hydrochloride form H2 by filtration or centrifugation.
12. A crystalline donepezil hydrochloride monohydrate, characterized by an x-ray powder diffraction spectrum having peaks expressed as 2θ at about 5.0, 10.0, 12.7, 13.2, 16.2, 20.0, 21.3, 23.1, 23.9 and 25.3 degrees.
- 5 13. A crystalline donepezil hydrochloride monohydrate as defined in claim 12, further characterized by an x-ray powder diffraction spectrum as in figure 3.
14. A process for preparation of donepezil hydrochloride monohydrate as defined in claim 12, which comprises the steps of:
- a) dissolving donepezil free base in a mixture of chloroform and water;
- 10 b) adding hydrochloric acid; and
- c) precipitating donepezil hydrochloride monohydrate from the solution formed in (b) by adding an anti-solvent.
- 15 15. A process according to claim 14, wherein the anti-solvent is diisopropyl ether, n-hexane, n-heptane or diethyl ether.
16. A process according to claim 14, wherein the anti-solvent is diisopropyl ether.
17. An another process for preparation of donepezil hydrochloride monohydrate as defined in claim 12, which comprises the steps of:
- a) dissolving donepezil hydrochloride in a mixture of chloroform and water; and
- 20 b) precipitating donepezil hydrochloride monohydrate from the solution formed in (a) by adding an anti-solvent.
18. A process according to claim 17, wherein the anti-solvent is diisopropyl ether, n-hexane, n-heptane or diethyl ether.
19. A process according to claim 17, wherein the anti-solvent is diisopropyl ether.
- 25 20. A crystalline donepezil hydrochloride sesquihydrate, characterized by an x-ray powder diffraction spectrum having peaks expressed as 2θ at about 5.1, 10.8, 12.8, 13.3, 13.9, 15.0, 16.3, 17.1, 17.7, 19.5, 20.1, 21.4, 23.2, 24.1, 26.6, 27.3, 28.2, 29.7, 31.9 and 35.3 degrees.
- 30 21. A crystalline donepezil hydrochloride sesquihydrate as defined in claim 20, further characterized by an x-ray powder diffraction spectrum as in figure 4.
22. A process for preparation of donepezil hydrochloride sesquihydrate as defined in claim 20, which comprises the steps of:
- a) dissolving donepezil free base in a mixture of tert-butyl alcohol and water;

- b) adding hydrochloric acid; and
 - c) isolating donepezil hydrochloride sesquihydrate by filtration or centrifugation.
23. A pharmaceutical composition comprising donepezil hydrochloride form H1 of claim 1 and a pharmaceutically acceptable carrier or diluent.
- 5 24. A pharmaceutical composition comprising donepezil hydrochloride form H2 of claim 9 and a pharmaceutically acceptable carrier or diluent.
25. A pharmaceutical composition comprising donepezil hydrochloride monohydrate of claim 12 and a pharmaceutically acceptable carrier or diluent.
- 10 26. A pharmaceutical composition comprising donepezil hydrochloride sesquihydrate of claim 20 and a pharmaceutically acceptable carrier or diluent.